

(a) providing at least one labeled nucleic acid probe having a complexity greater than about 40 kb which labeled nucleic acid probe comprises fragments which are substantially complementary to unique nucleic acid segments within the chromosomal DNA [material] for which detection is desired, wherein [fragments substantially] the nucleic acid probe is substantially free of repetitive segments which are complementary to repetitive segments in the target interphase chromosomal material [have been removed from the labeled nucleic acid probe]; and

H1 (b) employing said labeled nucleic acid probe and chromosomal DNA in in situ hybridization so that hybridization of unique segments within the labeled nucleic acid probe to the chromosomal DNA is allowed, and hybridized labeled nucleic acid containing unique segments are detected, and wherein the interphase chromosomal DNA is present in a morphologically identifiable chromosome or cell nucleus during the in situ hybridization.

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Please add new claims 95-97 as follows:

--95. The method of claim 72, wherein the targeted chromosomal material is a genetic rearrangement associated with chromosome 21 in humans.

H2 96. The method of claim 72, wherein fragments substantially complementary to repetitive segments in the target interphase chromosomal material have been removed from the labeled nucleic acid probe.